REMARKS

Applicant notes with appreciation the detailed comments that the Examiner made in the Office Action in response to Applicant's previous arguments. The present claim amendments are responsive to the Examiner's concerns noted in the Office Action.

a. Information Disclosure Statement

Enclosed is a full copy of the Sepaniak reference. Applicant respectfully requests consideration of this reference and indication of such in the record.Claim 21 have been withdrawn.

b. Claim Rejection – 35 USC §112

Applicant amended claims 1 and 16 to clarify the reference to "second width".

Referring to Fig. 2B in the present application, it is noted that as the analytes flow from the separation channel 504 of capillary column 22 into the collar 10 (i.e., detection section), the analytes remain subject to the applied potential. As a result, the analytes continue to maintain separation state (i.e., in the form of a series of separate analyte bands) as they migrate/flow past the detection zone 20. Some mixing or diffusion of the analytes may occur in the collar near the exit of the separation channel 504 (i.e., a transition in width from the width of the separation channel 504 to the width of the collar/detection section), but analytes "regroup" into separated state as they continue down along the collar 10 towards the detection zone 20. The detection zone 20 is located downstream from the exit in the wider collar 10, at a location to provide sufficient distance for the analytes to regroup before detection at the detection zone 20.

Applicant amended the specification to refer to the exit of the separation channel 504 into the collar 10 as a transition in width from the width of the separation channel 504 to the width of the collar 10. Such amendment is does not introduce new matter, as supported by Fig. 2B and accompanying disclosure in the specification as filed. As shown in Fig. 2B, the exit of the separation channel 504 is a well defined transition in the width from the width of the separation channel 504 to the width of the collar 10. Mixing or diffusion may occur in the collar 10, only after the analytes exit the exit of the separation channel 504. Accordingly, the operative transition point of relevance to diffusion, mixing and regrouping of analytes would be measure from such exit or transition.

Also referring to Fig. 13, which clearly shows a "transition" of a flow path of a first width to a second width. Intuitively, anywhere a flow path expands from a first width to a second width, inherently there must be a transition in width from the first width to the second width. This is the case with Fig. 13, as is also the case in Fig. 2B, and further in Fig. 9B and Fig. 10B. When viewed as a whole, Applicant respectfully submits that the disclosure supports the meaning of "transition".

Further, Applicant notes that the related patent application serial no. 09/887,872 had issued as U.S. Patent No. 6,529,275, which claims also employ this "transition" recitation based on essentially a similar disclosure with respect to this structure. While individual applications should be reviewed and examined on its own merits with respect to prior art, to find the use of similar recitation of "transition" in the present application to be unsupported by the original specification would be inconsistent and arbitrary discretion of the Examiners.

Applicant amended independent claims 1 and 16 to recite a location along the detection section defining a detection zone, said location being defined at a distance of 100 to 500 times

the second width of the detection section from the transition in width from the first width of the separation channel to the second width of the detection section. Applicant respectfully submits that independent claims 1 and 16 as amended are definite, given the disclosure of the specification as a whole, as to allow one or ordinary skill in the art to fully appreciate the scope of claims 1 and 16. The scope of the claim would be definite, as it is to be interpreted in light of the specification.

c. Claim Rejections – 35 USC §103

1. Zhu

Independent claims 1 and 16 were rejected by the Examiner as being unpatentable in view of U.S. Patent No. 5,763,277 to Zhu, and separately in view of U.S. Patent No. 5,650,846 to Yin. These rejections are respectfully traversed.

Zhu does not teach or suggest that the detection zone could or should be located at a distance 100 to 500 times of the width of the wider detection section, from the transition from the narrower separation channel, as required by the independent claims 1 and 16 as amended.

In fact, Zhu is silent in the written disclosure as to the location of the detection zone, much less disclose defining the detection zone to be at such a distance from the transition. Since there is no accompanying disclosure of the location of the tip of the fiber optic 3, one can and should only refer to what is specifically shown in the drawings in Zhu. Fig. 3 in Zhu shows the fiber optic 3 inserted into the increased inner diameter 1d of the bore 2, with the tip within 1 time of the increased diameter 1d from the transition from the smaller diameter. Fig. 3 does not specifically or by implication show the tip to be at the recited distance in claims 1 and 30 as

amended. Zhu did not address the concerns of mixing, diffusion and regrouping of analyte back into separated state, and accordingly Zhu would not have disclosed the specific location of the detection zone to be significantly downstream of the transition, without consideration of mixing, diffusion and regrouping of analytes.

Further, the location of the detection zone at the specific recited distance would not be an obvious matter of routine experimentation (or design choice), since the motivation for such issues as analyte mixing, diffusion and regrouping is not found anywhere in Zhu. The Examiner noted that one of ordinary skill in the art would vary the distance of the detection zone for optimization purposes, the varied distance would provide the benefits of mixing, diffusion and regrouping of the analyte. However, the Examiner failed to indicate where in Zhu such optimization is explicitly suggested. Without a suggestion of such optimization, Applicant submits that one of ordinary skill in the art would not have known what conditions or parameters to optimization, what are the considerations to be taken into account to optimize such parameters, let alone to know how to optimize such parameters.

In fact, Zhu teaches away from the present invention defined in claims 1 and 16. For example, concerning the issues of analyte mixing, diffusion and regrouping, Zhu does not even need to address these issues by simply placing the end of the optical fiber within 1 time of the increased diameter 1d from the transition from the smaller diameter. By having the detection fiber end close to the transition, there would be significantly less opportunity for analyte mixing and diffusion, and hence regrouping at a significant distance from the transition is not needed.

Applicant respectfully submits that Zhu is complete and functional in itself, so there would be no reason to modify Zhu in the manner suggested only by the Examiner. Given that Zhu chose to place the end of the optical fiber close to the transition, it does not make sense to

modify Zhu to have the end of the optical fiber at a significantly different distance from the transition. Any such modification of Zhu would frustrate its intended purpose. It is clear that Zhu and the present invention take mutually exclusive paths and reach different solutions for analyte detection. Consequently, Zhu teaches away (expressly or by implication) from the present invention. It would not be logical to modify Zhu to obtain the present invention.

Applicant respectfully submits that the Examiner have read and/or applied the cited cases out of context. Zhu is completely silent on the conditions or parameters to be taken into considerations for optimization. There are many conditions and parameters that should be taken into considerations (e.g., mixing, diffusion, regrouping, diameter of detection zone, etc.). Without any reference or discussion to any of these parameters and considerations, Zhu does not disclose "the general conditions of a claim ... disclosed in the prior art", or what range of variables that should be optimized! To find Zhu to render obvious the structure recited in claims 1 and 16 as suggested only by the Examiner, would necessarily require impermissible hindsight reconstruction made possible only by the disclosure of the present invention.

Further, the Examiner appeared to have taken judicial notice to support his conclusion that one of ordinary skill in the art would vary the distance of the detection zone for optimization purposes. Applicant respectfully objects to such judicial notice, and requests that the Examiner specifically identifies references that provide such support, which the Examiner is obligated to provide under the MPEP.

Accordingly, Zhu would not have rendered obvious the present invention defined in claims 1 and 16. All the dependent claims would likewise be non-obvious over Zhu.

2. Yin

Yin shares similar deficiencies as noted above for Zhu.

Further, Yin discloses the use of a "flare" for receiving the interfacing end of the optical fiber, thereby facilitating the alignment and nonfixed confinement of the interfacing end of the optical fiber. As used in Yin, non-fixed coupling between an end of a microcolumn and an end of an optical fiber refers to the positioning and maintaining the position of these ends relative to each other in close proximity without rigidly affixing any of these ends to any mechanical structure (see column 4, lines 29+). Close proximity is for the purpose of preventing "excessive loss of light around the interfacing end 30 of the optical fiber yet large enough to not hinder fluid from exiting the micro-column. For example, this distance (i.e., the gap) can be from about 0.2 to 0.5 of the outside diameter of the smaller of the microcolumn 12 and the optical fiber 14". (See column 5, line 34+.) As in the case for Zhu, the tip of the optical fiber is to be within less than one time the increased diameter of the flare from the transition from the smaller diameter section, not a widened section that extends to over 500 times the width of the widen opening from the narrower section.

Further, the structure of the detection configuration in Yin dictates the close proximity o of the detection fiber end to the transition. Yin uses a larger channel 122 in Fig. 8, which is coaxial to the capillary column 124 and the optical fiber 114. There is coaxial flushing fluid flow around the capillary column124 and optical fiber 114. The analytes exit from the flare 139 of capillary column 124, into the flushing fluid flow in the larger channel 122. There would be significant analyte diffusion and mixing with the flushing fluid throughout the downstream flushing flow. Accordingly, regrouping of mixed or diffused analytes is not possible and hence not contemplated in view of the flushing fluid. Consequently, Yin is only concerned with maintaining the end of the fiber in close proximity to the flared end of the capillary column 124

to detect analytes before such mixing and diffusion occur in the flushing flow, in additional to prevent excessive loss of light at the interface. It is not concerned with, and in fact need not be concerned with regrouping of analyte mixing and diffusion.

As in the case of Zhu, applicant respectfully submits that Yin in-fact teaches away from the present invention defined in claims 1 and 16. For example, concerning the issues of analyte mixing, diffusion and regrouping, Yin does not even need to address these issues by simply placing the end of the optical fiber within 1 time of the increased diameter from the transition from the smaller diameter. By having the detection fiber end close to the transition, there would be significantly less opportunity for analyte mixing and diffusion, and hence regrouping at a significant distance from the transition is not needed.

Applicant respectfully submits that Yin is complete and functional in itself, so there would be no reason to modify Yin in the manner suggested only by the Examiner. Given that Yin chose to place the end of the optical fiber close to the transition, it does not make sense to modify Yin to have the end of the optical fiber at a significantly different distance from the transition. Any such modification of Yin would frustrate its intended purpose. It is clear that Yin and the present invention take mutually exclusive paths and reach different solutions for different problems solved (Yin deals with analytes in flushing flow which cannot be regrouped, as compared analyte regrouping in the present invention). Consequently, Yin teaches away (expressly or by implication) from the present invention. It would not be logical to modify Yin to obtain the present invention.

The other arguments presented in connection with Zhu but not specifically mentioned here are equally applicable to Yin.

Accordingly, Yin would not have rendered obvious the present invention defined in claims 1 and 16. All the dependent claims would likewise be non-obvious over Yin.

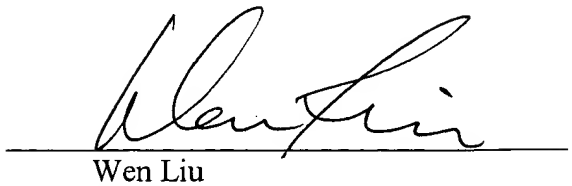
d. Double Patenting Rejections

Applicant does not believe the pending claims are subject to the judicial created doctrine of double patenting with reference to Applicant's patent no. 6,529,275 and copending Patent Application No.09/887,871. However, in the interest of forwarding this case to early issuance, Applicant will consider filing a terminal disclaimer once all other outstanding prior art rejections have been overcome.

CONCLUSION

In view of all the foregoing, Applicant submits that the claims pending in this application are patentable over the references of record and are in condition for allowance. Such action at an early date is earnestly solicited. **The Examiner is invited to call the undersigned representative to discuss any outstanding issues that may not have been adequately addressed in this response.**

Respectfully submitted,



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Enclosure: Sepaniak reference